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Impact of the pre-heat treatment on the crystallization of iron containing alumino-silicate glass fibres

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Abstract

Pre-heat treated alumino silicate glass fibres are known to exhibit improved mechanical properties for high temperature applications. To quantify this effect HT-fibres were pre-oxidised at different temperatures and for different durations and analysed by DSC with air or argon as reaction or protective gasses, SNMS and XRD. The pre-heat treatment causes the development of a crystalline surface layer. Comparisons of results show higher crystallisation temperatures when analysed by DSC in air and identified the source of a shoulder peak as a result of the air during the DSC upscan. Furthermore an increase of crystallisation temperatures with increasing pre-oxidation temperatures is observed.